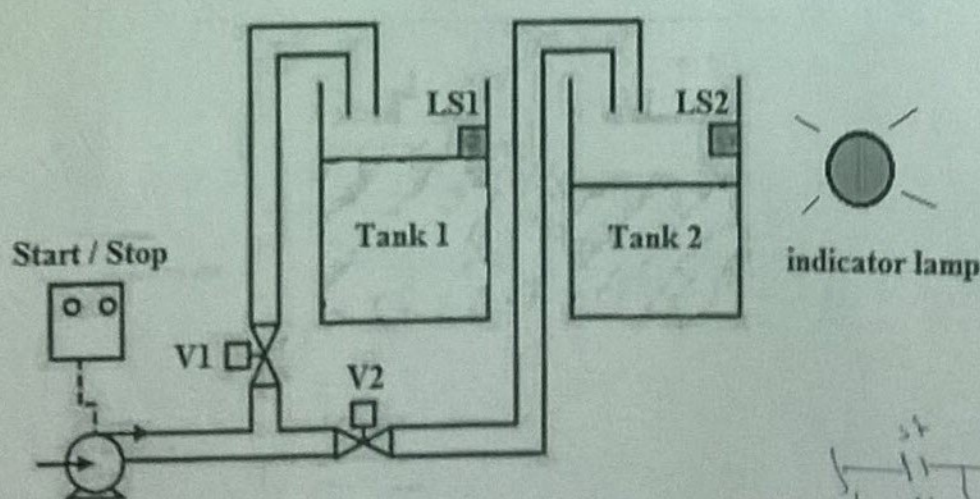
**Problem number (1) (10 Marks)**

- What is meant by PLC? What are the considerations you should take in choosing a PLC?
- Explain the main differences between timers and counters.
- What are types of memory used in PLCs? Explain the usage of internal bits and its type of memory.
- Escalator is an application example of using PLC; explain the role of PLC in this application.
- What are restrictions on programming with ladder diagram?

Problem number (2) (5 Marks)

In the following figure we want to fill tank1 and tank2 with water by the following sequence:

- When start switch is pressed, the valve (V1) opens to fill Tank1 with water until it reaches to the desired level (via floating switch LS1).
- The valve (V2) waits 3 Sec, and then it opens to fill Tank2 with water until it reaches to the desired level (via floating switch LS2).
- When Tank2 is full, the system stops automatically and a "sign lamp" is turned on to show that the process of filling the two tanks is ended.
- There exists a stop switch to end the process at any emergency time.



Good luck

Dr. M. Arafa